



**National Agricultural Higher Education Project (NAHEP)**  
**CAAST Sponsored Training**



**Genome assisted diagnosis of plant viruses, viroids and phytoplasmas**  
**(October 15-24, 2019)**

**Division of Plant Pathology, ICAR-IARI, New Delhi**

**Course at a glance**

<b>Date &amp; Day</b>	<b>Time</b>	<b>Activities</b>	<b>*Resource Persons</b>	<b>Venue</b>
15-10-2019 Tuesday	09:30-10:00 am	<b>Registration</b>	DJ/RK	Virology auditorium
	10:00-11:00 am	<b>Inauguration</b>	VKB/RP/GPR	do
	11:00-11:30 am	High Tea break	-	-
	11:30-12:00 pm	<b>1<sup>st</sup> MCQ test of candidates</b>	RP/NS	Virology auditorium
	12:00-01:00 pm	<b>L-1</b> “Introduction to plant viruses, their transmission and implications of diagnostics”	VKB	do
	01:00-02:00 pm	Lunch	-	-
	02:00-03:00 pm	<b>P-1</b> “Plant virus detection by DAC/DAS-ELISA from virus infected plant leaf tissue” (Antigen/antibody coating)	NS/RK/AS	PG Lab
	03:00-03:30 pm	Tea break	-	-
03:30-05:00 pm	<b>P-1</b> Continued (Blocking & antigen coating)	NS/RK/AS	PG Lab	
16-10-2019 Wednesday	09:30-11:00 am	<b>P-1</b> Continued (Primary antibody/Conjugate coating)	NS/RK/AS	PG Lab
	11:00-11:30 pm	Tea break	-	-
	11:30-01:00 pm	<b>L-2</b> “Use of viral genome sequences for virus classification and diagnosis”	RKJ	Virology auditorium
	01:00-02:00 pm	Lunch	-	-
	02:00-03:00 pm	<b>P-1</b> Continued (Secondary antibody coating)	AS/NS/RK	PG Lab
	03:00-04:00 pm	<b>P-1</b> Continued (Substrate addition & observation)	NS/RK/AS	do
	04:00-04:30 pm	Tea break	-	-
04:30-05:00 pm	<b>P-2</b> “Plant virus transmission through whitefly”	KBP/SC/MD	Cotton glass house	
17-10-2019 Thursday	09:30-10:30 am	<b>L-3</b> “Characterization and detection of viroids infecting important horticultural crops”	VKB	Virology auditorium
	10:30-11:00 am	Tea break	-	-
	11:00-01:00 pm	<b>P-3</b> “Plant virus & viroid detection by Reverse transcriptase-RT- PCR from virus infected plant leaf tissue” (RNA extraction and quantification)	RK/NS/PS	PG Lab
	01:00-02:00 pm	Lunch	-	-
	02:00-03:00 pm	<b>L-4</b> “Genome organization and use of genomic sequences for their nucleic acid based detection”	KKB	Virology auditorium

	03:00-03:30 pm 03:30-05:00 pm	Tea break <b>P-3</b> Continued (cDNA synthesis by Reverse transcriptase RT- PCR)	- RK/NS/PS	- PG Lab
18-10-2019 Friday	09:30-10:30 am 10:30-11:00 am 11:00-01:00 pm 01:00-02:00 pm 02:00-2:30 pm 02:30-3:00 pm 03:00-04:00 pm 04:00-04:30 pm 04:30-05:00 pm	<b>L-5</b> “Molecular characterization of okra viruses” Tea break <b>P-4</b> “Detection of Phytoplasma in plants” (DNA extraction and quantification) Lunch <b>P-4</b> Continued “PCR” <b>P-3</b> Continued “PCR” <b>L-6</b> “Genome based development in diagnosis of Phytoplasma” Tea break <b>P-3</b> Continued (Agarose gel electrophoresis & amplicon observation)	IDG - RH/MGR/SM - RH/MGR/SM RK/NS/PS GPR - RK/NS/PS	Virology auditorium - PG Lab - PG Lab do Virology auditorium - PG Lab
19-10-2019 Saturday	09:30-10:30 am 10:30-11:30 am 11:30-12:00 pm 12:00-01:00 pm 01:00-02:00 pm 02:00-03:00 pm 03:00-04:00 pm 04:00-04:30 pm 04:30-05:00 pm	<b>P-5</b> “RPA assay for the detection of plant viruses” <b>P-4</b> Continued (Nested PCR) Tea break <b>L-7</b> “Protein based diagnostics of plant viruses” Lunch <b>P-4</b> Continued (Agarose gel electrophoresis) <b>L-8</b> “Use of genome sequences for detection of multiple virus infection by multiplex PCR” Tea break <b>P-5</b> Continued (Agarose gel electrophoresis observation)	NS/RK/SK RH/MGR/SM - SR - RH/MGR/SM BR - NS/RK/SK	PG Lab do - Virology auditorium - PG Lab Virology auditorium - PG Lab
<b>20-10-2019 (Sunday)</b>				
21-10-2019 Monday	09:30-10:30 am 10:30-11:00 am 11:00-01:00 pm 01:00-02:00 pm 02:00-03:30 pm 03:30-04:00 pm 04:00-05:00 pm	<b>L-9</b> “Genome assisted diagnosis of plant pathogenic phytoplasmas” Tea break <b>P 6</b> “Duplex PCR for detection of banana DNA viruses” Lunch <b>P 6 Continued</b> (Agarose gel electrophoresis & amplicon observation) Tea break <b>P-7</b> “BSV detection using RCA”	AY - NS/SK - NS//SK - DJ	Virology auditorium - PG Lab - PG Lab - PG Lab
22-10-2019 Tuesday	09:30-11:00 am 11:00-11:30 am 11:30-01:00 pm 01:00-02:00 pm 02:00-03:00 pm 03:00-03:30 pm 03:30-05:00 pm	<b>L-10</b> “Genome characterization of circular DNA viruses using rolling circle amplification RCA” Tea break <b>P-7</b> Continued (Restriction enzyme analysis) Lunch <b>L-11</b> “Electron microscopy as a tool for detection of plant viruses” Tea break <b>P-8</b> (Electron Microscopy)	BM - DJ - RP - RP/BK	Virology auditorium - PG Lab - Virology auditorium - PG Lab
23-10-2019 Wednesday	09:30-10:00 am	<b>2<sup>nd</sup> MCQ test of applicants</b>	RP/NS	Virology auditorium

	10:00-11:30 pm	<b>L-12</b> “Application of real-time PCR technique in plant pathology”	AK	do
	11:30-12:00 pm	Tea break	-	-
	12:00-01:00 pm	<b>L-13</b> “Bioinformatics: A tool for sequence analysis of plant viral genome”	AK	Virology auditorium
	01:00-02:00 pm	Lunch	-	-
	02:00-03:30 pm	<b>P-9</b> “Bioinformatics”	AK, NS	PG Lab
	03:30-04:00 pm	Tea break	-	-
	04:00-05:00 pm	<b>P-9</b> Continued “Bioinformatics”	AK, NS	PG Lab
24-10-2019 Thursday	9:30 -10:00 am	Trainees feedback	-	Virology auditorium
	10:00-11:30 am	<b>L-14</b> “Exploring the relationship of thrips and tospoviruses”	AG	-
	11:30-12:00 pm	High tea break		Virology auditorium
	12:00 - 1:10 pm	Valedictory function	-	

**\*VKB – Virendra Kumar Baranwal, RP –RP Pant, RKJ – Rakesh Kumar Jain, KKB – Kajal Kumar Bishwas, IDG – Indranil Dasgupta, SR – Selvarajan, BR – Basavraj, AY – Amit Yadav, GPR – Govind Pratap Rao, BM – Bikash Mondal, AR –Aundy Kumar, AG – Amlendu Ghosh, KBP – K.B. Pun, RH – R. Hemavati, BK - Baljeet Kaur, SK – Shailender Kumar, NS – Nishant Srivastava, RK- Rakesh Kumar, DJ – Damini Jaiswal, MGR – M. Guruvi Reddy, SM – Surabhi Mitra, AS – Ashwani Kumar, SC – Supratik Palchaudhri, MD – Manisha Duhan, NS – Neelam Sheonam**